

(9) CLAIMS

1. An electronic book device comprising:
a rewritable viewing screen; and
an electrical printhead for writing picture elements of said viewing screen, wherein
5 said viewing screen has a rewritable electronic colorant for printing document content
therewith.
2. The device as set forth in claim 1, said colorant comprising:
bistable, bi-modal molecular colorant susceptible to electrical fields from said
printhead for forming said picture elements.
3. The device as set forth in claim 1 further comprising:
electronics for downloading, storing, sequencing, and erasably printing on the
screen.
4. The device as set forth in claim 1 further comprising:
a housing, and
15 said screen is biasingly extendable and retractable with respect to the housing such
that said screen passes across said printhead wherein one pass writes an entire screen
page.

5. The device as set forth in claim 4 further comprising:

said printhead includes a plurality of addressable electrodes such that screen pixel resolution is determined by electrode packing density.

6. The device as set forth in claim 1 further comprising:

said device is portable, having a self-contained power supply, memory, and electronic controls interconnected for processing data representative of alphanumeric characters and graphics for printing said data on said screen.

7. The device as set forth in claim 4 further comprising:

a biased roller, wherein said screen is a flexible sheet having one extremity affixed to a roller and an opposing extremity for selectively extending from and retracting into said housing.

8. The device as set forth in claim 7 comprising:

said housing has physical dimensions to accommodate said biased roller with said sheet wrapped thereabout and said printhead such that portability is maximized.

9. The device as set forth in claim 1 comprising:

a control pad providing interactive function controls for processing data displayed on said screen.

10. The device as set forth in claim 1 further comprising:

a wired or wireless input port for receiving at least one readable document electronically.

11. The device as set forth in claim 1 further comprising:

said viewing screen and printhead are operationally associated for printing a full page document content in a single pass of said screen across said printhead.

12. The device as set forth in claim 1 wherein document content resolution of a page printed on said screen is at least equal to commercial hard copy print resolution.

13. The device as set forth in claim 2, said colorant further comprising:

molecules that exhibit an electric field induced band gap change.

14. The device as set forth in claim 13 comprising:

said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

15. The device as set forth in claim 13 comprising:

said molecules have more than two said states, switchable such that optical

properties can be tuned either continuously by application of a decreasing or increasing electric field to form a volatile switch or color of selected composition regions is changed abruptly by application of voltage pulses to switch with at least one molecular activation barrier.

5 16. A rewritable digital book device comprising:

 a housing means for housing components of said device;

 means for downloading, storing, sequencing, and erasably printing document content; and

 viewing means for sequentially, erasably writing said content at a commercial grade high resolution hard copy pixel resolution.

17. The device as set forth in claim 16 comprising:

 said viewing means including means for printing said content using an electronic colorant means for erasably writing.

18. The device as set forth in claim 17 comprising:

15 said colorant means including a bistable, bi-modal molecular colorant system susceptible to electrical fields from said printhead for forming picture elements of said viewing means.

19. The device as set forth in claim 16 comprising:

said viewing means is extractable from said housing means such that said content is erased and written simultaneously in full page content via extraction and retraction.

20. The device as set forth in claim 16 comprising:

said means for downloading, storing, sequencing, and erasably printing document content including means for internet data and controls processing.

21. The device as set forth in claim 16 comprising:

said means for downloading, storing, sequencing, and erasably printing document content including wireless communication means for retrieving said content.

22. The device as set forth in claim 16 incorporated into a personal digital assistant apparatus.

23. The device as set forth in claim 22 comprising:

said viewing means is detachable from said device.

24. The device as set forth in claim 16 comprising:

said means for downloading, storing, sequencing, and erasably printing document content including an addressable molecular wire mechanism.

25. The device as set forth in claim 16 further comprising:

a screen having displayed thereon controls for manipulating said downloading, storing, sequencing, and erasably printing document content.

26. The device as set forth in claim 16 comprising:

said housing means is in a geometric form and size associated with hard copy newsprint.

27. The device as set forth in claim 16 comprising:

said housing means is in a geometric form and size of associated with pocket-sized commercial products.

28. The device as set forth in claim 16 further comprising:

associated with said means for downloading, storing, sequencing, and erasably printing document content, means for viewing means position sensing.

29. The device as set forth in claim 16 further comprising:

associated with said means for downloading, storing, sequencing, and erasably printing document content and said viewing means, means for controlling content printing on said viewing means.

30. A method of providing readable pages, the method comprising:
downloading data representative of each of said readable pages into a memory;
providing a viewing screen having an electric field addressable rewritable colorant thereon; and

5 writing each of said pages sequentially to the viewing screen by passing the screen adjacently across a printhead having electrical fields associated with pixels of the screen such that said data is transferred from said memory to said screen.

31. The method as set forth in claim 30, further comprising:
providing a communications interface capability for obtaining an electronic copy of a written document anytime and anyplace and in any known manner where a communications link can be established.

32. The method as set forth in claim 30 comprising:
using a bi-modal, bistable, molecular system for creating alphanumeric characters and graphic images on said screen.

15 33. The method as set forth in claim 32 wherein said system has molecules that exhibit an electric field induced band gap change.

34. The method as set forth in claim 33 wherein said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular

conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

35. A method of doing business of distribution of a document, the method comprising:
transmitting electronic data representative of said document; and

5 providing a customer with mechanisms associated with said transmitting for said customer to receive said data on a portable reading device having a single display screen including an electric field addressable rewritable colorant displaying said data in a form substantially identical to a hard copy form of said document.

36. The method as set forth in claim 35, further comprising:

10 using commercially-available communications interfacing for said transmitting such that an electronic copy of a written document anytime and anyplace and in any known manner where a communications link can be established.

37. The method as set forth in claim 35 comprising:

15 using a bi-modal, bistable, molecular system for creating alphanumeric characters and graphic images on said screen.

38. The method as set froth in claim 37 wherein said system has molecules that exhibit an electric field induced band gap change.

39. The method as set forth in claim 38 wherein said electric field induced band gap change occurs via a mechanism selected from a group including (1) molecular conformation change or an isomerization, (2) change of extended conjugation via chemical bonding change to change the band gap, and (3) molecular folding or stretching.

5 40. The method as set forth in claim 35 comprising:
providing said document in real-time on a page-by-page paid basis.

41. The method as set forth in claim 35 comprising:
providing said document in real-time on a document-by-document paid basis.

42. The method as set forth in claim 35 said mechanisms further comprising:
providing controls associated with ordering documents from an index of available documents.

43. The method as set forth in claim 35 said mechanisms further comprising:
providing security controls associated with purchase of said document.